CALYLOPHUS (OENOTHERA IN PART: ONAGRACEAE) IN TEXAS

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Dr. Raven's new look at *Oenothera* and its allies is sure to win adherents, though it will take some time to become adjusted to the unfamiliar nomenclature. Among the species conservatively included in *Oenothera,* those with entire or subentire stigma and widely flaring summit on the calyx tube form a very well-marked group. Users of the floras of Small and Rydberg have known them as *Meriolix* and *Galpinsia,* but the first generic name published with description was *Calylophus.* All the species recognized variously by Munz and Raven occur in Texas, as do most of the infraspecific taxons. Because a monographic treatment by Dr. Raven is not likely to be ready in time for one local and two state floras now in active preparation, this brief review has been prepared. It is based on 308 specimens in the S.M.U. Herbarium (205 of them from Texas), plus original descriptions of species and varieties previously published, and a few notes on type specimens given by Munz (1929).

Just as among the genera there are almost no differentiating characters that hold throughout, so every promising character for separating species and varieties breaks down in at least a few specimens, and the exceptional ones often do not seem to fall into any clear geographic pattern. For example, extremely short sepal-tips on the flower buds are typical of *C. Hartwegii* var. *lavandulaefolius,* but rarely a plant typical in other respects may have long sepal-tips. This conceivably could result from introgression with var. *Hartwegii* in the rather large area in which both occur. But in southern Trans-Pecos Texas the reverse variation is found, var. *Hartwegii* rarely showing extremely short sepal-tips, here outside the range of var. *lavandulaefolius.* I believe that the basic variation pattern, and chief cause of taxonomic difficulty, is one of homologous mutations, appearing especially in pubescence and leaf-form. Introgression also occurs (to a limited extent among the varieties of *C. Hartwegii,* more extensively between those of *C. serrulatus*), and along with seasonal variation, helps to complicate the picture. All this makes construction of dichotomous keys most difficult. Those given here are intended for identification, not definition, and are for use with plants in flower. When leaf dimensions are used, they are those of leaves on flowering stems. In the text are mentioned additional features which, though commonly present and helping to define the varieties, break down too often to be really useful in a working key.

SIDA 1 (6): 337—345. 1964.

Additional synonymy is to be found in the two publications of Munz (1929, 1944). I have cited only what was necessary to establish the nomenclature here adopted and to indicate the principal departures from the treatments of Munz. It would be most easy to add a long, speculative discussion of the history and relationships of the recognized taxons, but I do not feel that present knowledge justifies it.

KEY TO SPECIES

1a. Sepals with prominent raised midrib or low keel, flower buds 4-ribbed or 4-ridged, especially toward summit . . 1. *C. serrulatus*

1b. Sepals without prominent midrib or keel, flower buds smooth

2a. Calyx tube funnelform in upper 2/3 or more, 6—30 mm. long (above ovary) . . . . . 2. *C. tubicula*

2b. Calyx tube funnelform in upper 1/2 or less, 15—55 mm. long . . 3. *C. Hartwegii*

1. C. SERRULATUS (Nuttall) Raven, Brittonia 16: 286. 1964. Two varieties are recognized for Texas, with intermediates due partly to introgression, but also due partly to variation trends not related to introgression. More intensive study may justify recognition of the large-flowered southern phase of var. *serrulatus*, occurring mainly outside the range of the even larger-flowered var. *spinulosus*. Both varieties show more or less clinal variation, var. *serrulatus* in flower size, var. *spinulosus* in leaf-width, but the extremes are not considered worthy of nomenclatural recognition. A single specimen from Arizona combines the small flowers, short leaves, and pubescence of var. *serrulatus* with the narrow leaf-dimensions of var. *spinulosus*, but is outside the range of both. I consider this as belonging to a third variety, illustrating independent mutation or recombination of characters derived from a remote ancestor.[1]

KEY TO VARIETIES OF C. SERRULATUS

1a. Leaves 3½—9 times as long as wide . . . . . var. *serrulatus*

1b. Leaves (except lowest) 9—40 times as long as wide . . . . . var. *spinulosus*.

1a. C. SERRULATUS var. SERRULATUS. *Oenothera serrulata* Nuttall, Genera 1: 246—247. 1818. "From the river Platte to the mountains, on dry hills; flowering in June. . . . Stem simple, slender, 8 to 12 inches high, foliose; leaves a little more than an inch long, 2 to 3 lines wide, attenuated downwards, distinctly serrulate, not toothed. . . ." *O. serrulata* var. *Nuttallii* T. & G., Fl. N. A. 1: 501. 1840. (Based on the preceding, equivalent to what we now call var. *serrulata.*) *O. serrulata* var. *Drummondii* T. &. G., l. c. 502. "Low, minutely puberulent; stems simple;

[1] CALYLOPHUS SERRULATUS var. **arizonicus** Shinners, var. nov. Ad var. *serrulatum* statura minore, foliis et floribus parvis, pubescentia cinerea praecipue partium juniorum, ad var. *spinulosum* foliis perangustis (e.g. 27 × 2.2 mm. 28 × 2.8 mm.) accedit. HOLOTYPE: 4 miles upstream from White River on the White River, Navajo Co., Arizona, *S. J. Preece, Jr. & B. L. Turner 2692*, 25 June 1951 (SMU). "Dry sandy river bank; silty-sandy soil. Plant 1 foot or less high. Petals yellow. Tap-root woody."

leaves linear-spatulate or spatulate-oblong . . . ; flowers larger; capsules puberulent . . . Texas, *Drummond!*" (Based on *Calylophus Drummondii* Spach, whose description I have not seen, but the different form of the epithet makes it a new name rather than a new combination, and the citation of a specimen seen by T. & G. could also justify treating it as an entirely new and independent though synonymous name.) This name has been used by Munz chiefly for var. *spinulosus*, but the original description clearly indicates the larger-flowered phase of var. *serrulatus* common in southern Texas, while var. *spinulosus* is absent from the counties botanized by Drummond.

Plant low-growing, more or less gray pubescent, with short, subentire or rather bluntly and inconspicuously toothed leaves and small to moderately large flowers. Variations in Texas which may be due to introgression with var. *spinulosus* include plants with tall stems, or largely glabrate, or with large, prominently spinulose-toothed leaves, or in some cases large flowers, or combinations of these features. Probably most of the variation in toothing of leaves represents spontaneous mutations. At least in the southern part of the range, I believe that plants with large flowers and/or dark stigmas, represent homologous variations or descent from a remote ancestor, since they are prevalent outside the area of var. *spinulosus*. In Munz's treatments all large-flowered plants were treated under var. *Drummondii*, but flower size does not correlate well with leaf-dimension, which I believe permits a better geographic separation.

Panhandle to Grand Prairie (Denton and Tarrant counties), south and southeast to the lower Rio Grande Plain and Coastal Bend (east to Milam, Brazos, Jackson, and San Patricio counties), southwest to Loving, Ward, Val Verde, and Webb counties; absent from the Trans-Pecos. Two very narrow-leaved plants from the lower Rio Grande Plain are considered aberrant forms of this variety on grounds of locality (well outside the range of var. *spinulosus*), dwarf stature, and short leaves. KENEDY CO.: Yturria Ranch near Willacy Co. line, *Lundell & Lundell 8735*, 6 May 1940. (Leaves 31 X 3.1 mm., 27 X 3 mm., 26 X 3.2 mm.; plant apparently normal. Other collections from the region very similar to it have slightly wider leaves.) KLEBERG CO.: 12 miles southwest of Riviera, infrequent on sandy roadside, *Cory 55259*, 31 March 1949. (Leaves 30 X 1.1 mm., 25 X 2 mm.; an injury form, with small, slender shoots from apparently mowed and perhaps burned plants.)

1b. C. SERRULATUS var. **spinulosus** (Nuttall, ined.; ex T. & G.) Shinners, comb. nov. *Oenothera serrulata* var. *spinulosa* (Nutt., ined.) T. & G., Fl. N.A. 1: 502. 1840. "Taller, often branching, almost glabrous; leaves linear, elongated, acute (sometimes obtuse), spinulose-serrate; flowers rather large; capsules minutely pubescent.—OE. spinulosa, *Nutt.!* ined. . . . Arkansas, *Nuttall! Dr. Leavenworth!*" The locality refers to the Arkansas Territory of that time, including eastern Oklahoma which

almost certainly was the actual type of locality; I have seen no specimens from Arkansas. Reference is made to Hooker, Exotic Flora 2 t. 140, 1825, which shows the upper portion of a plant of this variety as here understood, the form with pure yellow flowers. As mentioned above, the plants treated by Munz as *Oenothera serrulata* var. *Drummondii* chiefly belong here.—*Oenothera serrulata* var. *pinifolia* Engelm. ex Gray, Boston Journ. Nat. Hist. 6 (Pl. Lindh. 2): 189. 1850. "Rocky prairies, New Braunfels. April.—This is just the OE. serrulata var. spinulosa, except that the leaves are extremely narrow." (See also Heller's comment, quoted under the next.)—*Meriolix melanoglottis* Rydb. ex Small, Fl. S.E. U.S. 846 and 1335. 1903. Type collection *Heller 1600*, about Kerrville, Kerr Co., Texas, 12—19 June 1894. There are two sheets of this number at S.M.U., apparently belonging to what had been two different collections, later combined under one distribution number. One is a whole plant 24 cm. tall, with root, in early flower, with linear-oblanceolate leaves, a representative one measuring 45 × 4.5 mm. The other has a piece of stem almost 11 cm. long with 7 branches up to 40 cm. long, bearing a few flower buds, and lance-linear leaves, a representative one measuring 43 × 2.5 mm. The original description covers both forms. Heller himself gave these comments in his *Botanical Explorations in Southern Texas* (Contrib. Herb. Franklin & Marshall College 1: 71, 1895): "Plentiful about Kerrville, especially along the Guadalupe and Town Creek, usually in gravelly or stony ground. Not only the throat of the calyx and the disk-shaped stigma are dark black-purple, but also the throat of the corolla. Of the hundreds of flowers seen, hardly half a dozen were without this marking. The variety *pinifolia* is merely a very narrow leaved form of this species. Both forms grow together and there is no other character to distinguish them."

Plant rather tall, glabrate, with long, very slender, spinulose-toothed leaves and moderately to very large flowers. Variations perhaps due to introgression with var. *serrulatus* are lower, or with more pubescence, or shorter leaves with less prominent teeth, or smaller flowers, or combinations of these features. Variation plainly due to spontaneous mutation is that in leaf form, running to the extreme which was named var. *pinifolia*, concentrated about the Edwards Plateau. I believe that dark pigmentation in the center of the flower, found in the southern part of the range, also represents spontaneous mutation.

Edwards Plateau, Grand Prairie and Blackland Prairie, extending west to Taylor and Val Verde counties, east in the northern part of its range to Prairie Border (Van Zandt Co.). Found north and northeast through Oklahoma and Kansas to Iowa, Minnesota, and Wisconsin (where perhaps introduced; the one specimen seen is from along railroad in Waukesha Co.). On the basis of the description given in Steyermark's *Flora of Missouri* (1963, p. 1102), it is this variety which is reported from that state as *Oenothera serrulata*. It occurs also in Coahuila.

Caroline Dormon, in *Flowers Native to the Deep South* (1958, pp. 84—85), speaks of *Meriolix melanoglottis* as "entirely distinct" (from *Oenothera spinulosa),* "and in the author's humble opinion it deserves specific rank. A perfect rock-garden plant, it has spreading wiry stems and linear leaves with a few scattered teeth. The lovely bright yellow flowers, about 1½ inches across, have many tiny folds, giving them a 'crepy' look. They open out flat and remain open all day, as do those of Cream-cups. The most distinctive feature of the flower is the litle black 'tongue' (stigma) . . . In the Deep South it is really a tiny shrublet, which remains green all winter. . . . Texas and southwestern Louisiana." I have not seen Louisiana material, but the supposedly distinguishing features described by Miss Dormon can be found in Texas in various combinations among plants of what I would consider perfectly typical *spinulosus.* The variability at the type locality for *Meriolix melanoglottis* observed by its original collector has already been mentioned. At Dallas the plant puts out slender, trailing to ascending, almost vine-like shoots with small leaves that are green over winter, just as Miss Dormon describes.

2. C. TUBICULA (Gray) Raven, Brittonia 16: 286. 1964. (The epithet is not in available dictionaries. Presumably it is an atypical diminutive of *tuba,* but the case of *radicula* and *radula,* words unrelated to each other, raises doubts.) *Oenothera tubicula* Gray, Smithsonian Contrib. 3 art. 5 (Pl. Wright. 1): 71. 1852. "Prairies beyond the Pecos; Aug.," *Wright 197.* "Also gathered in much larger and much better specimens in the collection of 1851." Including var. *demissa* Gray, ibid. 71—72. "On the Guadalupe Mountains; Oct.," *(Wright 197 (partim)).*

Northeastern Trans-Pecos and adjacent counties just east of the Pecos; specimens seen from Brewster, Culberson, Pecos, Presidio, Reeves, Terrell, and Ward counties, in flower from March to September. Annual or short-lived perennial with rather short, broad leaves; large-flowered forms are extremely similar superficially to *C. Hartwegii* var. *Hartwegii* (particularly those forms of the latter which have been treated as *Oenothera Hartwegii* var. *Fendleri)).*

3. C. HARTWEGII (Bentham) Raven, Brittonia 16: 286. 1964. A troublesome assemblage of forms, most of them wide-ranging and overlapping geographically. The extremes appear quite distinct, but there is so much variation that races cannot be sharply defined. I recognize five varieties in Texas; a sixth occurs in Arizona.[1]

All have an extended blooming season from spring to fall. Two contrasting patterns of variation are shown by those in Texas, two varieties having prevailingly broader, shorter leaves than var. *Hartwegii,* while two are consistently very narrow-leaved.

[1] C. HARTWEGII var. **Toumeyi** (Small) Shinners, comb. nov. *Galpinsia Toumeyi* Small, Bull. Torr. Bot. Club 25: 317. 1898. *Oenothera Hartwegii* var. *Toumeyi* (Small) Munz, Amer. Journ. Bot. 16: 708. 1929.

KEY TO VARIETIES OF C. HARTWEGII

1a. Leaves (except lowest) abruptly narrowed to truncate or slightly clasping at base, narrowly ovate or ovate-oblong to oblong or oblong-elliptic . . . . . 3c. var. *pubescens*

1b. Leaves gradually narrowed at base or extremely narrow throughout, filiform or linear to lanceolate, oblanceolate, or elliptic-lanceolate

2a. Leaves 2½—5 times as long as wide, widely spreading to slightly reflexed or occasionally ascending, sharply dentate or occasionally sub-entire; plants of lower Rio Grande Plain (also northeastern Mexico) . . . . . 3b. var. *Maccartii*

2b. Leaves 5—40 times as long as wide, ascending or rarely spreading, entire or occasionally sharply dentate (frequently so in Mexico); plants found west and north of lower Rio Grande Plain

3a. Leaves linear to oblanceolate or elliptic-lanceolate, 1.3—13.0 mm. wide, 5—20 times as long as wide (narrowest dimensions on summer or fall shoots of var. *lavandulaefolius* with dense, gray pubescence)

4a. Leaves linear-lanceolate to oblanceolate or elliptic-lanceolate, glabrous to sparsely pubescent (rarely rather densely and minutely pubescent with hairs up to 0.3 mm. long in plants from outside Texas) . . . . . 3a. var. *Hartwegii*

4b. Leaves linear or linear-lanceolate, gray with dense, mostly appressed hairs up to 0.6 mm. long . 3d. var. *lavandulaefolius*

3b. Leaves filiform to linear, 0.5—2.0 mm. wide, 12—40 times as long as wide, green, inconspicuously puberulent and glandular-viscid; plants of gypsum outcrops, northern Trans-Pecos (also adjacent New Mexico) . . . . . 3e. var. *filifolius*

3a. C. HARTWEGII var. HARTWEGII. *Oenothera Hartwegii* Bentham, Pl. Hartw. 5—6. 1839. From central Mexico; precise locality not known. The entire original description is quoted below; the first two lines appeared on p. 5, the rest on p. 6.

> 10. OENOTHERA Hartwegii, sp. n., suffruticosa, humilis, decumbens, foliis linearibus, lanceolatisve integris v. sinuato-dentatis glabriusculis, calycis parte libera ovario cylindrico sub-4-ies longiore apice infundibuliformi-inflato, laciniis ovato-lanceolatis glabriusculis longiuscule subulato-acuminatis, antheris stigma 4-partitum aequantibus.—Calycis tubus ultra 2 poll. longus. Corolla purpurea?

Oenothera Greggii Gray, Mem. Amer. Acad. 4 pt. 1 (Pl. Fendl.): 46. 1849. "Fruticulosa, ramosissima, erecta, undique minutissime viscido-puberula; foliis parvis (3—6 lin. longis) spathulatis vel oblanceolatis integerrimis sessilibus seu in petiolum pl. m. attenuatis; floribus parvulis; tubo calycis apice breviter obconico filiformi ovario sextuplo laciniisque triangulari-lanceolatis cuspidatis petala rhomboidea subaequantibus quintuplo longiore; capsula sessili oblongo-prismatica.—Hill southeast of Pelayo, in Chihuahua, *Dr. Gregg;* May, 1847. 'A very small semi-shrub; flower yellow.' The specimens are about 8 inches high, very bushy; the petals turn

to rose-color in drying, as in the allied species, and are one third of an inch in length. Capsules scarcely half an inch long." Munz (1929, pp. 709—710) makes these comments. "Gray's type is the smallest and most glabrate plant that I have seen, his variety *pubescens* being based on a type more like the other plants I have included under *Greggii* var. *typica*. But his var. *pubescens* is not worth varietal rank, the type of the variety *typica* being pubescent but more minutely so. *O. Greggii* var. *typica* intergrades freely with var. *lampasana*." On the basis of leaf shape, *Greggii* definitely belongs with var. *Hartwegii*, while *pubescens* and *lampasana* belong together but not with var. *Hartwegii*.—*Oenothera Greggii* var. *Pringlei* Munz, Amer. Journ. Bot. 16: 711. 1929. "Leaves and stems strigose-canescent; leaves 1—3(4) cm. long, 1—3(4) mm. wide, wavy-margined and denticulate." Type (not seen) from Bachimba Canyon, Chihuahua, *Pringle 224*. Description and locality definitely place this with var. *Hartwegii* as I understand it.—*Oenothera Fendleri* Gray, Mem. Amer. Acad. 4 pt. 1 (Pl. Fendl.): 45—46. 1849. "Minutissime pulverulento-glandulifera, glabra; caulibus e radice lignosa decumbentibus; ramis brevibus adsurgentibus; foliis lanceolatis oblongisve sessilibus subintegerrimis; calycis tubo apice infundibulari-inflato ovario prismatico sessili laciniisque triangulari-lanceolatis cuspidatis 3—4-plo longiore; petalis rhombei-obovatis stylo paulo longioribus.—Sunny hillsides at Santa Fe, and on the Rio del Norte; also (chiefly a narrow-leaved form) from Rock Creek eastward to the Cimarron River; May to August," *Fendler 230*. *O. Hartwegii* var. *Fendleri* Gray, Smithsonian Contrib. 5 art. 6 (Pl. Wright. 2): 58. 1853.

This is the most widespread and the most heterogeneous variety. Uncommon in Texas; known from the Panhandle, east in the Red Plains to Wilbarger Co., and from the Trans-Pecos, east to Uvalde and Val Verde counties. Until late in my study I attempted to maintain var. *Fendleri* as a more northern, more glabrous race with broader and more entire leaves (despite the inclusion of narrow-leaved forms in the original), but the separation proved far too weak to maintain. Stem glabrous or variously pubescent with short hairs only. One specimen from Reeves Co. (Lake Toyah, *Cory 52099*) has stems with short, erect hairs and some medium long ones, approaching var. *pubescens*, possibly due to introgression with the latter. A form with finely gray-pubescent leaves, superficially resembling var. *lavandulaefolius* but with shorter hairs, occurs in Mexico, well south of the range of the latter; I believe it should be regarded as a homologous mutation. I have not seen Texas specimens of this form.

3b. C. HARTWEGII var. **Maccartii** Shinners, var. nov. Folia plerumque patentia vel subreflexa, petiolata vel basi angustata, laminis denticulatis (rarius subintegris) oblanceolatis vel oblongo-lanceolatis pro ratione brevibus (ca. 10—38 mm. longis × 2—8 mm. latis). HOLOTYPE: U.S. Highway 83, 6 miles northwest of Rio Grande (City), Starr Co., Texas,

Rosa Ena Benavides 91, 24 March 1963. "In mesquite savannah." Two additional U.S. collections seen, both from Duval Co.: State Highway 44, 7 miles east of Freer, *Rebecca M. Rodriguez 104,* 18 March 1962. State Highway 359, 10 miles southwest of Benavides, *Elvira G. Garcia 113,* 22 March 1963. Found also in nearby parts of Mexico. NUEVO LEON. 108 km. (65 mi.) no. (sic! i.e. south) of Nuevo Laredo, on road to Monterrey, *T. C. & E. M. Frye 2369,* 19 April 1939. Highway 85, 45 miles south of Nuevo Laredo, *Juan G. Rivas, Platon Ostos & Wm. L. McCart 8133,* 17 March 1962. Villaldama Road, 16 km. west of Sabinas Hidalgo, *Martha Dominguez M. & Wm. McCart 8255,* 7 April 1962. Highway 85, 17 miles northwest of Sabinas, *Juan Jorge Rodriguez 70,* 20 March 1963. TAMAULIPAS. 20 miles east of the International Highway, by the Ribereña Road, *Lorenzo Escalante 55,* 24 April 1962.

Named in honor of William Larrey McCart, Head of the Science Department, Laredo Junior College, for his long and continuing services as an energetic collector of the Texas flora. Lest some hasty pedant accuse me of misspelling, it should be stated that the extra *a* has been added deliberately because it makes a better Latin form of the name. Records of *Oenothera Greggii* var. *Pringlei* from the Rio Grande Plain given by Munz (1944) probably belong here. The leaf dimensions he gives, apparently quoted from the original description, do not apply, but he notes that the Texas plants "are not quite so closely strigose, nor so narrow-leaved as plants from Coahuila and farther south, but they do approach the latter."

3c. C. HARTWEGII var. **pubescens** (Gray) Shinners, comb. nov. *Oenothera Greggii* var. *pubescens* Gray, Smithsonian Contrib. 3 art. 5 (Pl. Wright. 1): 72. 1852. "Pilis mollibus patentibus villosa.—Dry hills beyond the Pecos; Aug.," *Wright 199.* "Leaves oblong, 2—4 lines long." Though Munz refers to this in his discussion of *O. Greggii,* already quoted, he nowhere cites it in his lists of synonyms.—*O. lampasana* Buckley, Proc. Acad. Sci. Phila. 13 (1861): 454—455. 1862. "Caule subprostrato, glanduloso-pilosa; foliis numerosis, ovato-lanceolatis, integris, subsessilibus, acutis, glanduloso-pubescentibus . . . Prairies, Lampasas County." *O. Greggii* var. *lampasana* (Buckley) Munz, Amer. Journ. Bot. 16: 710. 1929.

Stems with long, widely spreading hairs together with short, erect, gland-tipped or glandular hairs and very short, incurved, glandless ones. Occasional plants have few or no glandular hairs, or only short, erect hairs; one specimen from Taylor Co. (east edge of Abilene, *Norlan C. Henderson 63-376*) has every dense pubescence of short to medium-long, mostly non-glandular hairs. Leaves usually short and rather wide; narrow-leaved forms might indicate introgression with other varieties, but the others are so uncommon or localized within the area of var. *pubescens* that spontaneous mutation seems a more likely explanation. This is much the most common variety in Texas, from the Panhandle and Red Plains

to the West Cross Timbers (Erath Co.), south to the northern Edwards Plateau, and southwest through the Trans-Pecos.

3d. C. HARTWEGII var. **lavandulaefolius** (T. & G.) Shinners, comb. nov. *Oenothera lavandulaefolia* T. & G., Fl. N.A. 1: 501. 1840. "Plains of the Platte, *Dr. James! Nuttall!* ('near Scott's Bluffs.') . . . Very nearly allied to the Mexican OE. Hartwegii, *Benth.*, which is a more glabrous plant, with narrower leaves, a more slender calyx tube, and subulate-acuminate segments." *O. Hartwegii* var. *lavandulaefolia* (T. & G.) S. Watson, Proc. Amer. Acad. 8: 590. 1873. *O. Hartwegii* var. *glandulosa* Munz, Amer. Journ. Bot. 16: 705. 1929. *Calylophus lavandulifolius* (T. & G.) Raven, Brittonia 16: 286. 1964. (I do not favor the half-baked pedantry of the Code recommendation—not rule—that the spelling be altered. Many Linnaean epithets were adapted from polynomials and are actually hyphenated words from which the hyphen had been dropped; they are not exactly the same as compound words, which the epithet here would become if spelled *lavandulifolius* instead of *lavandulaefolius*.)

Relatively uniform in having very narrow, densely gray-pubescent leaves (narrower than a majority of plants of var. *Hartwegii*, contrary to the statement in the original description), and nearly always with extremely short free tips to the sepals in bud, but these features are hardly sufficient to justify regarding it as a distinct species. The most northerly of the recognized varieties; as already noted under var. *Hartwegii*, occasional gray-pubescent forms from Mexico are better regarded as parallel mutations under that variety and not properly placed here. Frequent in the Texas Panhandle, south to Garza Co.; one record from the northern Trans-Pecos (northern Culberson Co.).

3e. C. HARTWEGII var. **filifolius** (Eastwood) Shinners, comb. nov. *Oenothera tubicula* var. *filifolia* Eastwood, Proc. Calif. Acad. (ser. 3) 1: 72. 1897. (This reference not seen; taken from Munz and the Gray Herbarium Card Index.) Type from White Sands, New Mexico. *O. Hartwegii* var. *filifolia* (Eastwood) Munz, Amer. Journ. Bot. 16: 707. 1929.

The most uniform of the accepted varieties, confined to gypsum outcrops in the Trans-Pecos and immediately adjacent counties; specimens seen from Culberson, Hudspeth, and Ward counties.

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